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Paper No. 18

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

Ex parte EDWARD W. LIU

Appeal No. 2000-0716  
Application No. 08/840,947

ON BRIEF

MAILED

OCT 19 2001

PAT. & T.M. OFFICE  
BOARD OF PATENT APPEALS  
AND INTERFERENCES

Before KRASS, JERRY SMITH, and LALL, Administrative Patent Judges.

KRASS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the final rejection of claims 1-18 and 20-29, all of the pending claims.

The invention is directed to a noise cancellation circuit in a mixed signal (i.e., analog and digital) environment.

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Representative independent claim 1 is reproduced as follows:

1. A circuit comprising:

a first circuit having a first input and a first output, wherein said first output includes a function of a signal at said first input and also includes a first noise component resulting from noise experienced by said first circuit;

a second circuit, located proximal to said first circuit and having a second input and a second output, wherein said second output includes a function of a signal at said second input and also includes a second noise component resulting from noise experienced by said second circuit, and wherein the second noise component is approximately equal to the first noise component; and

a subtractor circuit connected to said first circuit and to said second circuit to subtract said second output from said first output.

The examiner relies on the following reference:

Iwami                      5,546,458                      Aug. 13, 1996

Claims 1, 2, 4-7, 9-16, 20-22 and 24-29 stand rejected under 35 U.S.C. 102(b) as anticipated by Iwami.

Claims 3, 8, 17, 18 and 23 stand rejected under 35 U.S.C. 103 as unpatentable over Iwami.

Reference is made to the brief and answer for the respective positions of appellant and the examiner.

OPINION

We turn first to the rejection based on anticipation.

In Iwami, the examiner identifies a first circuit (38, 38a, 38b), a second circuit (40, 40a, 40b), a third circuit subtractor (36), a digital circuit (16), or some "other" digital circuit with the wireless telephone set (11), located proximal to the first and second circuits; and a plurality of analog circuits (54, 56, 58, 60, Figure 4), noise separator circuits (62, 64) and a noise canceling circuit (66).

With regard to claim 1, we agree with the examiner that Iwami discloses the claimed subject matter, with the first, second and subtractor circuits comprising the elements identified by the examiner.

It is appellant's position that Iwami does not disclose two circuits having output noise components, resulting from noise experienced by the circuits, that are "approximately equal," pointing out that Iwami discusses subtracting the outputs of two amplifier circuits whose inputs are connected to different microphones. Appellant contends that since Iwami says nothing about noise experienced by the amplifiers, it cannot disclose that the output noise components of the two amplifiers due to

such noise are approximately equal.

Appellant further contends that Iwami has no disclosure of the second circuit being "located proximal to said first circuit."

With regard to the location of the first and second circuits, we agree with the examiner that since the first and second circuits are shown within the same box (amplifier circuit 34), it appears clear that the second circuit (40, 40a, 40b) is "located proximal to said first circuit" (38, 38a, 38b).

With regard to the noise experienced by the first and second circuits being "approximately equal," the examiner explains, reasonably in our view, that since the amplifiers of Iwami may be of "the same type" [column 5, line 23] and they are located proximal with respect to each other, it would appear that amplifiers 38 and 40 would experience the same interference noise or electromagnetic environmental noise generated within the system. Since the examiner has shown, in a logical manner, that the two circuits of Iwami would have output noise components, resulting from noise experienced by the circuits, that are "approximately equal," and appellant has offered nothing to rebut this rationale, we will sustain the rejection of claim 1 under 35 U.S.C. 102(b). Since claims 14, 16 and 24 stand or fall with

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claim 1, in accordance with appellant's grouping of the claims, we will also sustain the rejection of claims 14, 16 and 24 under 35 U.S.C. 102(b).

With regard to claim 2, the examiner contends that control section 16 of Iwami is a "digital circuit," as claimed. However, we find no evidence of Iwami's control circuit 16 being "digital." From all of the drawings and the rest of the disclosure of Iwami, it would appear that Iwami deals with purely analog components. While the examiner contends that since the circuit in Iwami is used in the wireless telephone set "which is available in digital technology, e.g., a cellular phone," the control circuit of Iwami "is inherently a digital circuit" [answer-page 7], the examiner has offered no evidence that cellular telephones were, in fact, available in digital form at the time of Iwami's invention. Even if such digital cellular phones were available, it is clear that Iwami could also be analog. Therefore, since Iwami can disclose either analog or digital components, even viewing the examiner's position in the most favorable light, it cannot be said that Iwami's control circuit is "inherently a digital circuit," as contended by the examiner.

Accordingly, we will not sustain the rejection of claim 2 under 35 U.S.C. 102(b). Whether the subject matter of claim 2 would have been obvious under 35 U.S.C. 103, if the examiner could show that digital components for cellular phones were available at the time of appellant's invention, is, of course, a separate question. However, claim 2 stands rejected only under 35 U.S.C. 102(b), so in order to sustain this rejection, each element of the claim must be shown explicitly or inherently in Iwami.

We will sustain the rejection of claims 15 and 20 under 35 U.S.C. 102(b) because these claims require that the second circuit "is identical" to the first circuit. Appellant argues that Iwami does not say that his two input amplifiers are identical. However, the amplifiers in Figure 2 of Iwami appear to be the same, there is no indication in Iwami that they are not, and, when taken together with the disclosure, at column 5, lines 21-25, discussing Figure 4, that amplifier circuit 50 and the differential amplifier circuit 52 "can be constituted of the same type of operational amplifiers," it would appear to the artisan that Iwami employs identical amplifiers in the first and second circuits.

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Claims 21 and 29 recite that "the noise experienced by said first circuit and said second circuit is electromagnetic environmental noise." Appellant argues that Iwami does not disclose that the noise components resulting from electromagnetic environmental noise experienced by the input amplifiers are approximately equal. However, it is our view that the examiner has established a very reasonable basis for contending that the noise experienced by the first and second circuits are electromagnetic environmental noise and that this noise is approximately equal as it affects the first and second circuits. That is, according to the examiner, since "the noise contributed to the amplifier comprises internal noise generated by the components of the amplifier and the electromagnetic environment noise generated by other components within the system, and since the first amplifier (38) of Iwami is near the second amplifier (40), both transistors would experience the same magnitude electromagnetic environment noise" [answer-page 7]. Appellant has offered nothing to rebut this position.

Accordingly, we will sustain the rejection of claims 21 and 29 under 35 U.S.C. 102(b).

Claim 22 recites that the second circuit is located close enough to said first circuit so that said second circuit

experiences approximately the same noise as said first circuit. For the reasons supra, we will sustain the rejection of this claim under 35 U.S.C. 102(b).

With regard to independent claim 4, appellant reiterates the claimed subject matter, at page 14 of the brief, and argues that Iwami says nothing about noise experienced by the amplifiers and "certainly does not disclose that the output noise components of the two amplifiers due to such noise are approximately equal" [brief-pages 14-15]. Again, for the reasons articulated supra, we agree with the examiner and will sustain the rejection of claim 4 under 35 U.S.C. 102(b).

Since we find no digital circuit disclosed by Iwami, we will not sustain the rejection of claim 5, or of claim 6 which depends therefrom, under 35 U.S.C. 102(b), for the reasons supra, given with regard to claim 2.

With regard to claim 25, this claim, similar to claim 20, recites that the first and second circuits are "identical." For the reasons given supra, with regard to claim 20, we will sustain the rejection of claim 25 under 35 U.S.C. 102(b).

Claim 26 includes the same limitations recited in claim 21 and, for the same reasons, explained supra, we will sustain the rejection of claim 21, we will also sustain the rejection of



claim 26 under 35 U.S.C. 102(b).

With regard to independent claim 7, appellant argues that Iwami does not disclose supplying to the input of a second circuit a signal that is the inverse of the signal supplied to the input of a first circuit. Since the examiner has never addressed this issue, no prima facie case of anticipation has been shown and we will not sustain the rejection of claim 7 under 35 U.S.C. 102(b). Also since claims 8-10 and 27 depend from claim 7 and the rejection of claim 8 under 35 U.S.C. 103 also relies on Iwami, alone, we will not sustain the rejection of claims 9, 10 and 27 under 35 U.S.C. 102(b) or the rejection of claim 8 under 35 U.S.C. 103.

With regard to independent claim 11 and claim 12 which depends therefrom, appellant argues that Iwami does not disclose the plurality of analog circuits and a noise separator circuit producing a noise signal based on noise experienced by the noise separator circuit that is approximately equal to the noise components resulting from noise experienced by the plurality of analog circuits. Appellant also argues that the plurality of analog circuits and the noise separator circuit are located proximal to each other and Iwami does not disclose such a relationship.

In response, the examiner points to Figure 4 of Iwami, identifying a plurality of analog circuits as amplifiers (54, 56, 58, 60), identifying a noise separator circuit as Iwami's amplifiers (62, 64), and identifying a noise canceling circuit as Iwami's amplifier (66).

We will not sustain the rejection of claims 11 and 12 because the examiner has not pointed out how the various components identified in Iwami perform the claimed functions. For example, if amplifiers 54, 56, 58 and 60 are the claimed plurality of analog circuits, then the output signals produced by these amplifiers must include a noise component resulting from noise experienced by the amplifiers. While it may be reasonable to conclude that this is the case, claim 11 also requires that there be a noise separator circuit, proximal to the analog circuits, which produces a noise signal based on noise experienced by said separator circuit and wherein that noise signal is approximately equal to the noise component of the output signal output by each of the analog circuits. There is no indication in Iwami that the outputs of amplifiers 62 and 64, identified by the examiner as constituting the noise separator circuit, produce a noise signal approximately equal to the noise components of the outputs of amplifiers 54, 56, 58 and 60.

Moreover, if amplifier 66 of Iwami is the claimed noise canceling circuit, and its only inputs come from the "noise separator circuit," where is the input from the output signals of amplifiers 54, 56, 58 and 60 since the noise canceling circuit, as claimed, must process not only the noise signal from the noise separator circuit, but also the "output signals" from the plurality of analog circuits? The result of this processing is to "reduce the noise component of the output signal output by each of the plurality of analog circuits". Yet, nothing is shown in Iwami's Figure 4 that would indicate that amplifier 66 is such a processor.

Since claims 13 and 28 depend from independent claim 11, we also will not sustain the rejection of claims 13 and 28 under 35 U.S.C. 102(b).

Turning to the rejections under 35 U.S.C. 103, claim 3 recites that the subtractor circuit comprises a halving circuit which inputs a signal having an input amplitude and outputs the signal at one-half the input amplitude. While there is no teaching or suggestion of such a feature in Iwami, the examiner contends that such halving circuits are well-known (citing page 6, lines 22-25 of the instant specification) and that employing a halving circuit for reducing a signal by one-half of its

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magnitude in the Iwami circuit is "considered to be a design expedient..."

First, the cited portion of the specification only speaks of analog subtractors being "well known." In any event, while it may be known how to employ a "halving circuit," the question to be answered is why the artisan would have been led to employ such a circuit in Iwami in order to arrive at the instant claimed subject matter. Since appellant has a specific reason for employing such a circuit in order to achieve the desired results, it is dictated by more than a "design expedient." The examiner has not presented a cogent rationale for making the subtractor circuit a halving circuit which inputs a signal having an input amplitude and outputs the signal at one-half the input amplitude.

We will not sustain the rejection of claim 3 under 35 U.S.C. 103. For similar reasons, we also will not sustain the rejection of claim 18, which includes a similar limitation, under 35 U.S.C. 103.

While appellant includes claim 17 in "Group 18," together with claims 3 and 18, we find no substantive argument regarding the limitations of claim 17. Accordingly, claim 17 will fall with claim 14 and the rejection of this claim under 35 U.S.C. 103 will be sustained.

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Finally, we turn to claim 23. This claim requires the subtractor circuit to be "digital." Appellant's arguments, at pages 22-23 of the brief, appear to be a repeat of arguments presented regarding claim 1. The "digital" nature of the subtractor is not even mentioned. We find no reason to doubt the examiner when he concludes that the use of a "digital" subtractor, in place of the Iwami's subtractor, would have been well known. Accordingly, we will sustain the rejection of claim 23 under 35 U.S.C. 103.

#### CONCLUSION

We have sustained the rejection of claims 1, 4, 14-16, 20-22, 24-26 and 29 under 35 U.S.C. 102(b) and we have sustained the rejection of claims 17 and 23 under 35 U.S.C. 103. However, we have not sustained the rejection of claims 2, 5-7, 9-13, 27 and 28 under 35 U.S.C. 102(b) and we have not sustained the rejection of claims 3, 8 and 18 under 35 U.S.C. 103.

Accordingly, the examiner's decision is affirmed-in-part.

*Sustained Rejection - 1, 4, 14-16, 20-22, 24-26, 29*  
*Not Sustained = 2, 5-7, 9-13, 28*  
*3, 8, 18*



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